

Indiana State Department of Health Guidelines for Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Indiana Schools

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Methicillin-Resistant *Staphylococcus aureus* (MRSA) Overview

John F. Kennedy once said, “Change is the law of life.” This is true of many bacteria, including *Staphylococcus aureus*. *S. aureus* has changed over the years, becoming resistant to many antibiotics in order to survive. It usually causes mild skin infections, such as pimples, impetigo, rashes, or boils, but can cause more severe illness, such as bloodstream and bone infections and pneumonia. *S. aureus* commonly resides on the skin or in the nose of healthy people and does not cause infection. In the past, most serious *S. aureus* infections were treated with a certain type of antibiotic related to penicillin. Over the past 50 years, treatment of these infections has become more difficult because the bacteria have become resistant to various antibiotics, including the commonly used penicillin-related antibiotics. These resistant bacteria are called methicillin-resistant *S. aureus* (MRSA).

MRSA has historically been isolated from hospitalized and long-term care patients. Some patients have become colonized with the organism. MRSA has been associated with intensive care units (ICU) and in persons with chronic illnesses who have taken multiple antibiotics. MRSA associated with these hospitalized and long-term care patients has been resistant to most of the available antibiotics and is very difficult to treat.

Since 2000, the number of healthy adults and children with MRSA infections has steadily increased. Many of these people have had skin infections, such as pustules and boils. The MRSA isolated from these otherwise healthy people is different from the MRSA traditionally isolated from very ill individuals. MRSA isolated from healthy adults and children is susceptible to more of the currently available antibiotics than MRSA found in the very ill; thus, there are more treatment options available.

MRSA: Infection and Colonization

Colonization is the presence of the bacteria on a person’s body without observable clinical symptoms. When this bacterium is isolated from a healthy individual, the person is said to be colonized. It is estimated that 25-30% of the United States population is colonized with *S. aureus* at any given time. The number of MRSA colonized people at any one time is not known. When a person is colonized, bacteria live on the skin but cause no harm.

Infection refers to the invasion of the bacteria into tissue with growth of the organism. Infection may occur when the bacteria enter a break in the skin. MRSA infection is characterized by a laboratory test positive for MRSA accompanied by clinical signs of illness, such as fever, elevated white blood count, and inflammation.

Healthy people are generally at low risk for developing MRSA infection. People with compromised immune systems, which may include some patients with the human immunodeficiency virus (HIV), may be at risk for more severe illness if they get infected with MRSA.

How is MRSA spread?

MRSA is spread among people who have close contact with people who harbor the organism. Both colonized and infected patients are major reservoirs of the bacteria, but when a person is infected, it is more likely that the organism could be transmitted to others. MRSA is almost always spread by direct physical contact and not through the air. Transmission of MRSA may also occur through indirect contact by touching objects, such as towels, clothes, bandages, or sports equipment contaminated by the infected skin of a person with the bacteria.

In 2003, an outbreak of MRSA occurred among a football team in Indiana. MRSA was isolated from the skin infections of players. A study was conducted to determine if anyone else associated with the team was colonized with MRSA in the nose. It is interesting to note three individuals had nasal carriage with MRSA. Additional microbiology testing showed that those nasal carriers all had distinct strains of MRSA that were different than the outbreak strain. Everyone who was ill was infected with the same outbreak strain. The colonized people were not spreading MRSA.

MRSA Colonized Students in the Classroom

Children colonized with MRSA should not be excluded from the classroom. The reasons for this recommendation include:

- Since the prevalence of MRSA is increasing in the community, it is likely that there are colonized students in the classroom who are not aware that they harbor the organism. Thus, excluding a child known to be colonized with MRSA would be relatively ineffective in reducing the risk of MRSA infection to classmates.
- The risk for acquisition of MRSA in the school setting by children, including those who are medically or developmentally challenged, is no greater than the risk of contracting a skin infection caused by other pathogens.

The overall risk of infection from MRSA in the school setting will not be appreciably increased when children who are colonized with MRSA are admitted. The risk will not be appreciably decreased when colonized children are excluded. However, exclusion will adversely affect the colonization children by depriving them of an education, without benefiting the children already present in the setting.

Skin Infections in the Classroom, Including MRSA

Any infection or draining wound could pose a threat to others. When a student with a MRSA infection is in the classroom, certain infection control measures should be in place. These measures include, but may not be limited to:

- Keep infections, particularly those that produce pus or drainage, covered with clean, dry bandages. The student should follow the healthcare provider's instructions on proper care of the wound. Pus from infected wounds can contain bacteria, including MRSA, and spread the bacteria to others. Bandages should be disposed in a manner such that others would not have contact with the drainage (e.g., in a closed baggie).
- Advise those who may have contact with the infected wound to wash their hands thoroughly with soap and warm water. Persons who expect to have contact with the infected wound should wear disposable gloves, and wash their hands after removing the gloves. Hand washing is the single most important measure to prevent MRSA transmission.

- Avoid sharing personal items (e.g., towels, washcloths, clothing) that may have come in contact with the infected wound. Wash soiled linens and clothes with hot water and laundry detergent. Drying clothes in a hot dryer, rather than air-drying, also helps kill bacteria.
- Clean potentially contaminated surfaces carefully with a disinfectant or a bleach-water solution (1:100 dilution of sodium hypochlorite, which is approximately ¼ cup of 5.25% household chlorine bleach to 1 gallon of water) after caring for the wound.

Schools should continue to provide general cleaning on a regular schedule. Students who are infected with MRSA should follow the healthcare provider's treatment plan, including completion of any antibiotics prescribed.

MRSA in Athletics

Transmission of MRSA among sports participants is a concern. Possible risk factors for infection include close physical contact, skin damage, and sharing of equipment or clothing. The risk for transmission of MRSA is much greater among sports participants than among students in a classroom. The U.S. Centers for Disease Control and Prevention (CDC) has published the following guidance for preventing staphylococcal skin infections in the sports setting:

- Cover all wounds. If a wound cannot be covered adequately, consider excluding players with potentially infectious skin lesions from practice or competitions until the lesions are healed or can be covered adequately.
- Encourage good hygiene, including showering and washing with soap after all practices and competitions.
- Ensure availability of adequate soap and hot water.
- Discourage sharing of towels and personal items, such as clothing or equipment.
- Establish routine cleaning schedules for shared equipment, including mats.
- Train athletes and coaches in first aid for wounds and recognition of wounds that are potentially infected.
- Encourage athletes to report skin lesions to coaches and encourage coaches to assess athletes regularly for skin infections.

Development of Policies

Indiana schools may consider developing policies related to MRSA-infected students and related to prevention of skin infections in individuals participating in sports. School wrestling programs may wish to review guidance provided by the National Federation of State High School Associations when developing school policies related to skin infections. Frequent hand washing should always be encouraged.

Indiana State Department of Health Contact

The Indiana State Department of Health is available for consultation. If you have questions or concerns, please contact Julia Butwin, MSN, RN at 317/233-7825, or via e-mail at jbutwin@isdh.state.in.us.

Additional Reading:

Chamber F. The Changing Epidemiology of *S. aureus*. Emerging Infectious Diseases. 2001; 7 (2)
<http://www.cdc.gov/ncidod/eid/vol7no2/chambers.htm>

Community-Associated MRSA: Frequently Asked Questions
Centers for Disease Control and Prevention
http://www.cdc.gov/ncidod/hip/Aresist/mrsa_comm_faq.htm

Methicillin-Resistant *Staphylococcus aureus* Infections Among Competitive Sports Participants ---
Colorado, Indiana, Pennsylvania, and Los Angeles County, 2000-2003
Centers for Disease Control and Prevention
Morbidity and Mortality Weekly Report 2003, 52 (33); 793-795
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5233a4.htm>

American Academy of Pediatrics. Staphylococcal Infections. In: Pickering LK ed. Red Book: 2003 Report of the
Committee on Infectious Disease. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003: 561-
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Information on Staphylococcal Infections School Athletic Departments: Instructions for Athletes.
Texas Department of Health
http://www.tdh.state.tx.us/ideas/antibiotic_resistance/mrsa/school_athletic_athletes.asp

Physician Release for Wrestlers to Participate with Skin Lesions
National Federation of State High School Associations
http://www.nfhs.org/staticcontent/pdfs/wrestling_physician_form03.pdf

Skin Infections in Contact Sports
Utah Department of Health
<http://health.utah.gov/els/skininfect/>
